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EXAMINER	
AILES, BENJAMIN A	
ART UNIT	**PAPER NUMBER**
2142	

DATE MAILED: 02/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/896,228	WATSON ET AL.	
	Examiner	Art Unit	
	Benjamin A. Ailes	2142	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 October 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-54* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-54* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to correspondence received 25 October 2005.

2. Claims 1-=54 remain pending.

Claim Rejections - 35 USC § 112

3. The amendment to claim 1 has been entered into the record. The 112, second paragraph, rejection of claims 1-26 has been withdrawn.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1, 9, 10 and 27-30 rejected under 35 U.S.C. 103(a) as being unpatentable over Rao et al. (US 6,674,756), hereinafter referred to as Rao, in view of Jourdenais et al. (US 5,278,986), hereinafter referred to as Jourdenais.

7. Regarding claim 1, Rao discloses the use of a host router (col. 19, lines 28-33), but does not explicitly disclose the use of a common operating system. However, it is deemed inherent in the computer networking arts for an operating system to be used in order for the computer to work and run processes correctly.

Rao discloses a plurality of virtual router domains and processes logically partitioned within said host router (see col. 19, lines 28-33, *another feature of the multi-service network switch is the ability to partition the switch into multiple virtual routers where each virtual router has allocated to it a set of resources).*

Rao discloses each said virtual domain having a unique domain ID (see col. 19, lines 47-52, *A new virtual router is preferably created by assigning it a unique name and a unique VR ID).*

Rao discloses the use of a host router but does not explicitly disclose how variables in the system are handled. However, variables are commonly used in all types of computer applications. Examiner cites Jourdenais as an example environment wherein variables are used. Jourdenais provides an environment where variables can be stored in an array (Abstract, lines 4-9), variables can be stored as scalar variables (Abstract, lines 4-9), and variables can be accessed using references (Abstract, lines 4-9).

One of ordinary skill in the art at the time of the applicant's invention would have found it useful to utilize variables in a router because, as demonstrated by Jourdenais, variables are widely used in computer applications as well as the use of global variables, making it possible for many computer applications under the same host operating system being able to share the same variables.

Rao discloses each process being run in a virtual router domain independently of all other said virtual router domains on top of said common operating system (col. 19, lines 32-33, ...*each virtual router functions as a separate router in an independent and self-contained manner).*

8. Claims 9, 10, and 27-30 contains similar subject matter and is rejected under the same rationale as claim 1.

9. Claims 2 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rao and Jourdenais, in view of what was well known at the time of invention, being Applicant admitted prior art (AAPA), incorporation of such functional subject matter being obvious to one of ordinary skill in the art at the time the invention was made.

10. Regarding claims 2 and 31, Rao discloses the use of a host router as disclosed in claim 1 but does not explicitly disclose the operating system being run on a Master Control Processor within said host router. One of ordinary skill in the art at the time of the applicant's invention would have been motivated to utilize running the operating system on a Master Control Processor in order to properly route applications and/or processes. See the present application, page 2, for precise explanation and direct admission of these assertions as admitted prior art, disclosed in the background of the disclosed invention.

11. Claims 3, 8, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rao and Jourdenais, in view of Kurose et al. (U.S. 2002/0035641), hereinafter referred to as Kurose.

12. Regarding claims 3 and 32, Rao does not explicitly state the use of FreeBSD. However in related art, Kurose teaches the use of FreeBSD in a computer-networking environment (see Page 5, para. 0083). One of ordinary skill in the art at the of the applicant's invention would

have recognized the wide use of the operating system, FreeBSD, and would have been motivated to use FreeBSD because of the fact that is a well known operating system.

13. Regarding claim 8, Rao does not explicitly state the use of SNMP. However in related art, Kurose teaches the use of SNMP in a computer-networking environment (see Page 7, para.0114). One of ordinary skill in the art at the of the applicant's invention would have recognized the wide use of the networking application, SNMP, and would have been motivated to use SNMP because of the fact that is a well known networking application.

14. Claims 4-7, 11-14, and 33-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rao.

15. Regarding claim 4, Rao discloses the system wherein said common operating system manages the reporting of hardware failures across all virtual router domains of said host router (see col. 21, line 62 – col. 22, line 3, *...ability to provide fault tolerance through automatic protection switching hardware and software. APS allows component failures within the switch and external link failures to be isolated and service be restored via backup components.).*

16. Regarding claims 5, 33, and 36, Rao discloses the system wherein said plurality of processes comprises routing software applications (see col. 20, lines 4-10, *...each Virtual Router (VR) has an instance of an IP protocol stack and its own routing table for routing protocols including RIP, OSPF, GBP...).*

17. Regarding claims 6 and 34, Rao discloses the system wherein said plurality of processes comprise independent plural identical copies of at least one said process (col. 19, lines 34-38 and 53-61).

18. Regarding claims 7 and 35, Rao discloses the system wherein said plurality of processes comprise a copy of a dynamic routing protocol (DRP) software application (see col. 20, lines 4-10, RIP and OSPF are just two examples dynamic routing protocols).

19. Regarding claims 11 and 37, Rao discloses the system further comprising a plurality of interfaces partitioned interchangeably among said virtual domains, such that a particular interface is associated with only one such virtual router domain at one time, but can be repartitioned among said virtual router domains to reconfigure said host router (see col. 19, lines 47-52 and 62-67, *...the new Virtual Router (VR) is then configured by setting-up its physical interfaces, IP interfaces, and enabling its routing protocols...*).

20. Regarding claims 12, 38, and 39, Rao discloses the system wherein during said reconfiguring network traffic is removed from said interfaces that are repartitioned (see col. 19, lines 53-61, *...a portion of the resources available to the system are allocated to the newly created VR...*).

21. Regarding claims 13 and 40, Rao discloses the system wherein said interface contains the unique domain ID address of said virtual router domain with which said interface is associated (see col. 19, line 67 – col. 20, line 3, *...the resource manager identifies the VR ID of the incoming call and dynamically allocates the modem or ISDN resources...*).

22. Regarding claims 14 and 41, Rao discloses the system wherein said interface is an interface port of said host router (see Fig. 17).

23. Claims 15 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rao and Jourdenais, in view of what was well known at the time of invention, being Applicant admitted

prior art (AAPA), incorporation of such functional subject matter being obvious to one of ordinary skill in the art at the time the invention was made.

24. Regarding claims 15 and 42, Rao discloses the use of a host router having interface ports (see Fig. 17) but does not explicitly disclose the number of interface ports present on the system being 320 interface ports. One of ordinary skill in the art at the time of the applicant's invention would have recognized a typical router in the networking field having 320 interface ports. See the present application, page 2, for precise explanation and direct admission of these assertions as admitted prior art, disclosed in the background of the disclosed invention.

25. Claims 16-19, 21-26, 43-47, 49-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rao.

26. Regarding claims 16 and 43, Rao discloses the system further comprising a socket created by at least one said process, said socket being associated exclusively with the virtual router domain in which it is created and containing said unique domain ID address of said domain in which it is created (see col. 19, line 67 – col. 20, line 3, ...*When a call is received, the resource manager identifies the VR ID of the incoming call and dynamically allocates the modem or ISDN resources if it is within the limits set for the VR*...).

27. Regarding claims 17 and 44, Rao discloses the system wherein multiple sockets are created by said at least one process in at least one said virtual router domain, such that said at least one process creates a said socket in each of at least two said virtual router domains (see col. 20, lines 11-15, ...*Each VR may further be partitioned into multiple virtual private networks for controlling access to certain portions of the VR*...).

28. Regarding claims 18 and 45, Rao discloses the system wherein said at least one process is movable from one said virtual router domain to a different said virtual router domain, such that said at least one process creates a said socket in each of at least two said virtual router domains (see col. 19, lines 34-38, *...system resources are not tied to a particular slot or interface, allowing them to be flexibly partitioned among the various VRs.)*.

29. Regarding claims 19 and 47, Rao discloses the system wherein a particular socket associated with a particular virtual router domain is applied exclusively to live traffic networking independently of any other said virtual router domain of said host router (see col. 20, lines 11-15, *Each VR may further be partitioned into multiple virtual private networks (VPNs) for controlling access to certain portions of the VR. Access is controlled by filtering software that filters traffic directed to the VR based on criteria such as source and/or destination addresses.)*.

30. Regarding claims 21 and 49, Rao discloses the system wherein each of said virtual router domains maintains an independent routing table (see col. 19, lines 28-33, *...each VR has allocated to it a set of resources and routing tables. Thus, each VR functions as a separate router in an independent and self-contained manner.*).

31. Regarding claims 22 and 50, Rao discloses the system wherein each said socket uses the routing table of said virtual router domain in which said socket is created (see col. 20, lines 4-10).

32. Regarding claims 23 and 51, Rao discloses the system wherein said two distinct virtual router domains use the same Internet Protocol addresses without conflicting (col. 11, lines 13-27).

33. Regarding claims 24 and 52, Rao discloses the system wherein one particular virtual router domain within said host router contains routing tables exclusively for internal interface addresses within said host router independently of any other said virtual router domain of said host router (see col. 19, lines 53-61).

34. Regarding claims 25 and 53, Rao discloses the system wherein a particular virtual router domain within said host router contains routing tables exclusively for interfaces externally visible from outside said host router independently of any other said virtual router domain of said host router (col. 19, lines 53-61).

35. Regarding claims 26 and 54, Rao discloses the system wherein a failure of one of said plurality of said virtual router domains does not adversely affect a different one of said plurality of said virtual router domains (col. 8, lines 7-17).

36. Regarding claim 46, Rao discloses the method wherein said process maintains a file descriptor table containing pointers to said sockets associated with said virtual router domain (col. 20, lines 22-28).

37. Claims 20 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rao and Jourdenais, in view of Snay et al. (U.S. 6,282,678), hereinafter referred to as Snay.

38. Regarding claims 20 and 48, Rao does not explicitly disclose the use of a test bed operation. However, Snay discloses a method of conducting a test bed operation in a network system using routers (col. 4, lines 30-37). One of ordinary skill in the art at the time of the applicant's invention would have been found it useful to combine the test bed operations disclosed by Snay and the virtual router partitioning method disclosed by Rao. One of ordinary

skill in the art would have been motivated to make such a combination in order to design and perform accurate router tests needed (see Snay, col. 4, lines 30-37).

Response to Arguments

39. Applicant's arguments filed 25 October 2005 have been fully considered but they are not persuasive.

40. (A) Applicant argues in regards to claim 1 on pages 12-13 of the response (see Remarks) that Rao does not teach or suggest "each said process running in a said virtual router domain independently of all other said virtual router domains" The Examiner disagrees. Rao clearly suggests that processes are run independently from the mere fact that Rao discloses that each virtual router is run independently and in a self-contained manner. Examiner does not understand how the Applicant concludes that each Virtual Router could share processes when it is clearly disclosed by Rao that each virtual router runs independently and in a self-contained manner. There is no evidence found by the Examiner of the independent self-contained virtual routers disclosed by Rao having the ability to share processes. Therefore it is concluded that Rao's independent and self-contained virtual routers do not share processes.

41. (B) Applicant argues in regards to claim 27 on page 13 of the response (see Remarks) that Rao does not teach or suggest "each said process running in a said virtual router domain independently of all other said virtual router domains" The Examiner disagrees. Rao clearly suggests that processes are run independently from the mere fact that Rao discloses that each virtual router is run independently and in a self-contained manner. Examiner does not understand how the Applicant concludes that each Virtual Router could share processes when it is clearly disclosed by Rao that each virtual router runs independently and in a self-contained

manner. There is no evidence found by the Examiner of the independent self-contained virtual routers disclosed by Rao having the ability to share processes. Therefore it is concluded that Rao's independent and self-contained virtual routers do not share processes.

42. (C) Applicant argues in regards to claims 9 and 29 on pp. 13-14 of the response (see Remarks) that Rao and Jourdenais do not teach or suggest "said macros generate an array of said global variables when said virtual router domain is configured in" because Jourdenais does not describe how and when an array of global variables is generated, much less that an array of global variables is generated by a macro when a virtual router domain is configured in and Rao does not teach how and when an array of global variables are generated. The Examiner had cited for claims 9 and 29 in view of claim 1 that Rao discloses the use of a host router but does not explicitly disclose how variables in the system are handled. However, variables are commonly used in all types of computer applications whether they be static or dynamic. Examiner cites Jourdenais as an example environment wherein variables are used. Jourdenais provides an environment where variables can be stored in an array (Abstract, lines 4-9), variables can be stored as scalar variables (Abstract, lines 4-9), and variables can be accessed using references (Abstract, lines 4-9). One of ordinary skill in the art at the time of the applicant's invention would have found it useful to utilize variables in a router because, as demonstrated by Jourdenais, variables are widely used in computer applications as well as the use of global variables, making it possible for many computer applications under the same host operating system being able to share the same variables. Therefore, Rao in view of Jourdenais satisfy the limitations as written in claims 9 and 29.

43. (D) Applicant argues in regards to claims 10 and 30 on pp. 13 of the response (see Remarks) that Rao and Jourdenais do not teach or suggest "said macros generate scalar global variables when said virtual router domain is deconfigured" because Jourdenais does not describe how and when scalar global variables are generated, much less that scalar global variables are generated by a macro when a virtual router domain is deconfigured and Rao does not teach how and when scalar global variables are generated. The Examiner had cited for claims 10 and 30 in view of claim 1 that Rao discloses the use of a host router but does not explicitly disclose how variables in the system are handled. However, variables are commonly used in all types of computer applications whether they be static or dynamic. Examiner cites Jourdenais as an example environment wherein variables are used. Jourdenais provides an environment where variables can be stored in an array (Abstract, lines 4-9), variables can be stored as scalar variables (Abstract, lines 4-9), and variables can be accessed using references (Abstract, lines 4-9). One of ordinary skill in the art at the time of the applicant's invention would have found it useful to utilize variables in a router because, as demonstrated by Jourdenais, variables are widely used in computer applications as well as the use of global variables, making it possible for many computer applications under the same host operating system being able to share the same variables. Therefore, Rao in view of Jourdenais satisfy the limitations as written in claims 10 and 30.

44. (E) Applicant argues in regards to claims 6 and 34 on pp. 15 of the response (see Remarks) that Rao does not teach or suggest the claim limitation "independent plural identical copies of at least one said process" The Examiner disagrees. Rao does at the least suggest such feature. Rao discloses in col. 19, lines 34-38 and 53-61 the utilization of system resources by the

"virtual" routers. In order for a virtual router to utilize a resource (i.e. a dial modem) a process must be run. When a second virtual router utilizes the same type of resource (i.e. the dial modem used previously), the same process must be run (in order for the dial modem to work properly). Therefore, Rao discloses the ability for two different self-contained and independent virtual routers to run the same identical process.

45. (F) Applicant argues in regards to claims 12 and 39 on pp. 15 of the response (see Remarks) that Rao does not teach "during said reconfiguring network traffic is removed from said interfaces that are repartitioned" The Examiner disagrees. Rao teaches in col. 19, lines 53-61 the allocation of resources (steps taken to set up network traffic). It is deemed inherent to have the ability to also tear down or remove network resources (remove network traffic), It is also inherent that when a virtual router changes positions, all network connection are lost (losing all network traffic), causing network connections to be reallocated to the new location.

46. (G) Applicant argues in regards to claims 16, 17, 43, and 44 on pp. 16 of the response (see Remarks) that Rao does not teach the "exclusive associations" of claims 16, 17, 43, and 44, essentially, as best determined by the Examiner, the step of "creating a socket" The Examiner disagrees. The applicant defines on page 2, lines 13-14 and page 7, lines 11-12 of the specification filed 29 June 2001 the term "socket" to mean "endpoints of communication associated with a process." Rao discloses in col. 9, line 67 – col. 10, line 3 the allocation of an endpoint (i.e. modem) in order to connect a line of communication. The resource manager creates the connection between a remote communication endpoint and the virtual router's communication endpoint (or socket, as defined by the Applicant's specification).

47. (H) Applicant argues in regards to claims 18 and 45 on pp. 16 of the response (see Remarks) that Rao does not teach or suggest "said at least one process is moveable from one said virtual router domain to a different said virtual router domain, such that said at least one process creates a said socket in each of at least two said virtual router domains" because it does not teach or suggest a moveable process that creates sockets in at least two virtual router domains. Examiner disagrees. In view of argument (G), Rao does in fact disclose the use of sockets and the ability to share system resources. In col. 19, lines 34-38 of Rao, Rao discloses a system wherein resources are flexibly partitioned among multiple virtual routers (shared). Therefore, the system as disclosed by Rao is deemed equivalent to applicant's claimed "moveable process" because the system resource that creates processes is used by multiple virtual routers.

48. (I) Applicant argues in regards to claims 19 and 47 on pp. 16-17 of the response (see Remarks) that Rao does not teach or suggest "a particular socket associated with a particular virtual router domain is applied exclusively to live traffic networking independently of any other said virtual router domain of said host router" because it does not teach such exclusive application of a particular socket independent of other virtual router domains. In view of argument (G), Rao does in fact disclose the use of sockets. Rao discloses in column 20, lines 11-15 the method of utilizing particular routers for virtual private networking. Therefor, this feature of Rao is deemed the equivalent of having "exclusive application" of independent virtual router domains.

49. (J) Applicant argues in regards to claims 24 and 52 on p. 17 of the response (see Remarks) that Rao does not teach or suggest "one particular virtual router domain within said host router contains routing tables exclusively for internal interface addresses within said host

router independently of any other said virtual router domain of said host router" because it does not teach such routing tables exclusively for internal interface addresses with the host router and independent of other virtual router domains. The Examiner disagrees because Rao clearly discloses the use of routing tables in column 11, lines 28-45 for identification. Therefore, it is determined that Rao suggests the use of routing tables in tracking "internal" addresses due to the use of virtual private networking.

50. (K) Applicant argues in regards to claims 24 and 52 on p. 17 of the response (see Remarks) that Rao does not teach or suggest "a particular virtual router domain within said host router contains routing tables exclusively for externally visible from outside said host router independently of any other said virtual router domain of said host router" because it does not teach such routing tables exclusively for externally visible interfaces and independent of other virtual router domains. The Examiner disagrees because Rao clearly discloses the use of routing tables in column 11, lines 28-45 for identification. Therefore, it is determined that Rao suggests the use of routing tables in tracking "externall" addresses due to the use of virtual private networking.

Conclusion

51. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Benjamin A. Ailes whose telephone number is (571)272-3899. The examiner can normally be reached on M-F 6:30-4, IFP Work Schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Caldwell can be reached on (571)272-3868. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

baa

Beatriz Prieto
BEATRIZ PRIETO
PRIMARY EXAMINER
2/4/06